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and simple; even when it is diffuse, the author never hides his thoughts with words either large or small. It is a work that will well repay the reading. The typography of the book is excellent.

James M. Taylor

Colgate University

Uniplanar Algebra. Being Part I of a Propædeutic to the Higher Mathematical Analysis. By IRVING STRINGHAM, Ph. D. San Francisco: The Berkeley Press, 1893. pp. xii+141.

If any one expects to find in this little book a text-book on algebra like, except in name, to most text-books on that subject he will be disappointed. The book is not a beginner's book; it is elementary only in so far as it begins at the beginning.

Starting with the theory of proportion as stated by Euclid, the author builds upon this the algebra of real quantities and establishes the laws of combination of such quantities by simple geometrical constructions. After devoting a chapter to the definition and discussion of the circular and hyperbolic functions he takes up the algebra of complex quantities. By means of Argand's mode of representation he shows that the laws which were established for real apply as well to complex quantities. At the end of this chapter he states briefly and clearly the characteristics of a logically complete algebra, and incidentally points out that an algebra which "admits evolution and the logarithmic process, but precludes the imaginary and the complex quantity is logically only the fraction of an algebra."

Then follow three chapters devoted respectively to generalized circular and hyperbolic functions, to graphical transformations and to the properties of polynomials. The first two of these, though interesting in themselves, are digressions from the main argument and might perhaps be omitted without serious injury to the book. The third, however, is more important, for it contains a proof of the so-called fundamental theorem of algebra, viz: that every algebraic equation has a root, a theorem which in most text-books is not proved and in many is totally ignored.

In his preface Professor Stringham calls attention to the fact that algebra, unlike geometry, which is a model of exact reasoning, has become "a collection of processes practically exemplified and of principles inadequately explained." He has endeavored in his book to do just the reverse and to give to his readers the theory and not the practice of algebra. In our opinion he has succeeded exceedingly well. The first four chapters give a complete and well-reasoned account of the fundamental principles of algebra. Moreover, the book is interesting from the fact that it contains things not found in the ordinary text-books. Such for example are: Euclid's theory of proportion, Napier's definition of

logarithms, the author's own extension of this definition to complex quantities, and a very complete graphical representation of the analogy between circular and hyperbolic functions. We think it safe to say that both the teacher and the student of mathematics will find the book eminently pleasing and stimulating.

Paul Saurel

Cornell University

Economic Geology of the United States. By Professor RALPH S. TARR of the Cornell University. New York: Macmillan & Co.

This volume as noted in the preface was prepared as "a textbook to accompany a series of lectures given by the author to a class in economic geology at Cornell university." The geological aspects of the subject are emphasized and the author says frankly that the work is in many parts a compilation, though by brief abstract, rather than by quotation. Part I, filling 115 pages, consists of introductory chapters treating of the common minerals, the rocks of the earth's crust, the outline geography and geology of the United States, and the origin of ore deposits.

These chapters contain some restatements of geological principles, which, though necessarily brief, are excellent; as on page 28, the discrimination of terms applied to the sedimentary rocks, and the discussion of the geological time-scale beginning on page 43. The same may be said of the summarized geological history of the United States, pages 65-71.

Part II deals with the metalliferous deposits. Under each head, the classes of ore, their origin, mode of occurrence, uses, distribution, and productions are lucidly treated. Part III takes up the non-metallic mineral products, as coal, petroleum, natural gas, asphaltum; building stones and cements; soils, clays, and fertilizers; precious stones and abrasive materials. The appendix gives a short account of the literature of economic geology. Professor Tarr's book is the third in this special field, for which Cornell may receive credit: Professor S. G. Williams's smaller work, having been followed recently by Professor Kemp's "Ore Deposits," the materials for which were largely gathered at Cornell as well as at Columbia.

Albert P. Brigham

Colgate University

The English Religious Drama. By KATHERINE LEE BATES, Wellesley College. New York: Macmillan & Co.

It is with pleasure that we commend the book whose title we have given above. It is one that may well serve as a bright and winning introduction to the earliest English drama. A subject,